	ATTACHMENT I – General Qualifications **ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO: ADSPO15-00004729**	**STATE PROCUREMENT OFFICE** **Department of Administration** **100 North 15th Avenue, Suite 201** **Phoenix, Arizona 85007**

DEFINITIONS

Architect Services, Engineer Services, Land Surveying Services, Assayer Services, Geologist Services and Landscape Architect Services: Those professional services within the scope of the practice of those services as provided in ARS § 32-101.

Branch Office: A geographically distinct place of business or subsidiary office of a firm that has a key role on the team.

Discipline: Primary technical capabilities of key personnel, as evidenced by academic degree, professional registration, certification, and/or extensive experience.

Firm: Defined in ARS § 32-101(B.19.).

Key Personnel: Individuals who will have major contract responsibilities and/or provide unusual or unique expertise.

SPECIFIC INSTRUCTIONS:

1 . Complete this form for each branch office seeking work under this RFQ.

a . – e. **Firm (or Branch Office) Name and Address.** Self-explanatory.

f. **Year Established**. Enter the year the firm (or branch office, if appropriate) was established under the current name.

g. **Ownership**.

(g1). *Type*. Enter the type of ownership or legal structure of the firm (sole proprietor, partnership, corporation, joint venture, etc.).

(g2). *Small Business Status*. A firm is a small business if the firm has less than 100 employees **or** has gross revenues of $4 million or less.

h.-j. **Point of Contact**. Provide this information for a representative of the firm that the Customer can contact for additional information. The representative must be empowered to speak on contractual and policy matters.

k. **Name of Firm**. Enter the name of the firm.

2. **Employees by Discipline**.

a. Select disciplines from the List of Disciplines (Function Code) listed on Page 3 of 4 Instructions. For employees that do not qualify for any of the disciplines, select Other. *Note: The intended searchable database indicated in the RFQ will be populated from the Qualifications Form I Excel attachment only.*

b. Each person can be counted only twice; once for his/her primary function and once for his/her secondary function. Primary and secondary functions should be indicated by including a “P” or an “S” in column b after the Description Title is given.

c-d. If the form is completed for a firm (including all branch offices), enter the number of employees by disciplines in column c. If the form is completed for a branch office, enter the number of employees by discipline in column d and for the firm in column c.

3. **Profile of Firm's Experience and Annual Average Revenue for Last Year**.

a. Enter the approximate number of projects the firm (or branch) has done attributable by Profile Code listed on Page 3 of 4 Instructions over the last year.

b. Enter the appropriate Profile Codes from Instructions Pages 3 of 4 that represent the type of work the firm (or branch) has done over the last year.

c. Using the Revenue Index Number on Page 3 of 6 Form, indicate the approximate revenue the firm has earned over the last year per Profile Code entered into the table.

4. **Resumes of Key Personnel Proposed for This Contract.** Complete this section for each key person who will participate in this contract.

   a. Self-explanatory.
   b. Self-explanatory
   c. Total years of relevant experience (block c1), and years of relevant experience with current firm, but not necessarily the same branch/office (block c2).
   d. Name, City and State of the firm where the person currently works, which must correspond with one of the firms (or branch office or a firm, if appropriate) listed in Section 1.
   e. Provide information on the highest relevant academic degree(s) received. Indicate the area(s) of specialization for each degree.
   f. Provide information on current relevant professional registration(s) and in which State(s) they are current.
   g. Provide information on any other professional qualifications relating to this contract, such as education, professional registration, publications, organizational memberships, certifications, training, awards, and foreign language capabilities.
   h. Provide information on no more than five (5) projects in the last year which the person had a significant role that demonstrates the person's capability relevant to her/his proposed role in this contract. These projects do not necessarily have to be any of the projects presented in Section 5 for the project team if the person was not involved in any of those those projects or the person worked on other projects that were more relevant than the team projects in Section 5. Use the check box provided to indicate if the project was performed with any office of the current firm. If any of the professional services or construction projects are not complete, leave Year Completed blank and indicate the status in Brief Description and Specific Role.

5. **Example Projects Which Best Illustrate Firms Qualification for this contract.** Select project where multiple team members worked together, if possible, that demonstrate the team's capability to perform work similar to that required for this contract. Complete one Section 5 for each project. List no more than five (5) projects.

   a. Title and Locations of project or contract. For an indefinite delivery contract, the location is the geographic scope of the contract.
   b. Enter the year completed of the professional services (such as planning, engineering study, or design), and/or the year completed if construction. If any of the professional services or the construction projects are not complete, leave Year Completed blank and indicate the status in Brief Description of Project and Relevance to This Contract (block f).
   c. Project Owner or user, such as a government agency or installation, an institution, a corporation or private individual.
   d. Provide the original budget or not to exceed dollar amount for the project.
   e. Provide the Total Cost of the Project. If any of the professional services or construction projects is not complete, indicate the percentage compete and whether this project will be on budget, over or under budget.
   f. Brief Description: Indicate scope, size, and length of project, principle elements and special features of the project. Discuss the relevance of the example project to this contract.

6. **Additional Information**. Use this section to provide additional information you feel may be necessary to describe your firm's qualifications for this contract.

7. **Annual Average Professional Services Revenues of Firm for Last 3 Years**. Complete this block for the firm or branch office for which this form is completed. In column a, enter an approximate percentage of total work attributable to State, Federal or Municipal Work. In column b, enter an approximate percentage of total work attributable to Non-Government work. Percentages should take into consideration work completed over the last 3 years.

8. **Authorized Representative**. An authorized representative of the firm or branch office must sign and date the completed form. Signing attests that the information provided is current and factual. Provide the name and title of the authorized representative who signed the form.

List of Disciplines (Function Codes) for Question 2

Aeronautical Engineer
Agricultural Engineer
Archeologist
Architect
Architectural Engineering
Biologist
CADD Technician
Chemical Engineer
Civil Engineer
Construction Manager
Construction Inspector
Control Systems Engineer
Cost Engineer/Estimator
Ecologist
Electrical Engineer
Environmental Engineer
Environmental Scientist
Fire Protection Engineer
Geodetic Surveyor
Geographic Information System Specialist
Geological Engineer
Geologist
Hydrographic Surveyor
Hydraulic Engineer
Hydrologist
Industrial Engineer
Landscape Architect
Mechanical Engineer
Metallurgical Engineer
Mining Engineer
Nuclear Engineer
Petroleum Engineer
Photogrammetrist
Project Manager
Sanitary Engineer
Soils Engineer
Structural Engineer
Technician/Analyst
Transportation Engineer
Water Resources Engineer

List of Experience Categories (Profile Codes for Question 3)

Acoustics, Noise Abatement
Aerial Photography; Airborne Data and Imagery Collection and Analysis
Activity Centers
Air Pollution Control
Airports; Navaids; Airport Lighting; Aircraft Fueling
Airports; Terminals and Hangars; Freight Handling
Agricultural Development; Grain Storage; Farm Mechanization
Animal Facilities
Anti-Terrorism/Force Protection
Area Master Planning
Auditoriums and Theaters
Automation; Controls; Instrumentation
Barracks; Dormitories
Bridge Design: Bridges
Cartography
Cemeteries *(Planning and Relocation)*
Chemical Processing and Storage
Child Care/Development Facilities
Codes; Standards; Ordinances
Cold Storage; Refrigeration and Fast Freeze
Commercial Building *(Low Rise)*; Shopping Centers
Community Facilities
Communications Systems; TV; Microwave
Computer Facilities
Conservation and Resource Management
Construction Management
Construction Surveying
Corrosion Control; Cathodic Protection Electrolysis
Cost Estimating; Cost Engineering and Analysis; Parametric Costing; Forecasting
Cryogenic Facilities
Construction Materials Testing
Dams *(Concrete; Arch)*
Dams *(Earth; Rock)*; Dikes; Levees
Desalinization *(Process and Facilities)*
Design-Build - Preparation of Requests for Proposals
Digital Elevation and Terrain Model Development
Digital Orthophotography
Dining Halls; Clubs; Restaurants
Dredging Studies and Design
Design & Planning Structured Parking Facilities
Detention Security Systems
Disability / Special Needs
Ecological and Archeological Investigations
Educational Facilities; Classrooms
Electrical Studies and Design
Electronics
Elevators; Escalators; People-Movers
Energy / Water Auditing Savings
Energy Conservation; New Energy Sources
Environmental Impact Studies, Assessments or Statements
Fallout Shelters; Blast-Resistant Design
Fire Protection
Fisheries; Fish Ladders
Forensic Engineering
Garages; Vehicles Maintenance Facilities; Parking
Gas Systems *(Propane; Natural, Etc.)*
Geodetic Surveying: Ground and Airborne
Heating; Ventilating; Air Conditioning
Highways; Streets; Airfield Paving; Parking Lots
Historical Preservation
Hospital and Medical Facilities
Hotels; Motels
Housing (Residential, Multi-Family; Apartments; Condominiums)

Hotels; Motels
Hydraulics and Pneumatics
Hydrographic Surveying
Industrial Buildings; Manufacturing Plants
Industrial Processes; Quality Control
Industrial Waste Treatment
Intelligent Transportation Systems
Infrastructure
Irrigation; Drainage
Judicial and Courtroom Facilities
Laboratories; Medical Research Facilities
Land Surveying
Landscape Architecture
Libraries; Museums; Galleries
Lighting *(Interior; Display; Theater, Etc.)*
Lighting *(Exteriors; Streets; Memorials; Athletic Fields, Etc.)*
Labs - General
Labs – Research – Dry
Labs – Research – Wet
LEED Accredited A/E
LEED Independent 3rd Party Building Commissioning
Mapping Location/Addressing Systems
Materials Handling Systems; Conveyors; Sorters
Metallurgy
Materials Testing
Measurement / Verification / Conservation Water Consumption Savings
Mining and Mineralogy
Medical Related
Modular Systems Design; Fabricated Structures or Components
Mold Investigation
Museums
Nuclear Facilities; Nuclear Shielding
Office Buildings; Industrial Parks
Outdoor Recreation
Petroleum and Fuel *(Storage and Distribution)*
Photogrammetry
Pipelines *(Cross-Country - Liquid and Gas)*
Phase I Environmental
Prisons & Correctional Facilities
Plumbing and Piping Design
Prisons and Correctional Facilities
Product, Machine Equipment Design Pneumatic
Structures, Air-Support Buildings Power Generation,
Transmission, Distribution Public Safety Facilities
Radar; Sonar; Radio and Radar Telescopes
Radio Frequency Systems and Shielding's
Railroad; Rapid Transit
Recreation Facilities *(Parks, Marinas, Etc.)*
Refrigeration Plants/Systems
Rehabilitation *(Buildings; Structures; Facilities)*
Research Facilities
Resources Recovery; Recycling
Roof Infrared Imaging to Identify Water Leaks
Roofing
Safety Engineering; Accident Studies; OSHA Studies
Security Systems; Intruder and Smoke Detection
Seismic Designs and Studies
Sewage Collection, Treatment and Disposal
Soils and Geologic Studies; Foundations
Solar Energy Utilization
Solid Wastes; Incineration; Landfill
Special Environments; Clean Rooms, Etc.
Structural Design; Special Structures
Surveying; Platting; Mapping; Flood Plain Studies
Sustainable Design
Swimming Pools
Storm Water Handling and Facilities
Specifications Writing
Toxicology
Testing and Inspection Services
Traffic and Transportation Engineering
Topographic Surveying and Mapping
Towers *(Self-Supporting and Guyed Systems)*
Tunnels and Subways
Traffic Studies
Transportation
Urban renewals; Community Development
Utilities *(Gas and Steam)*
Value Analysis; Life-Cycle Costing
Warehouse and Depots
Water Resources; Hydrology; Ground Water
Water Supply; Treatment and Distribution
Wind Tunnels; Research/Testing Facilities Design
Waste Water Treatment Facility
Water Well Rehabilitation; Water Well Work
Zoning; Land Use Studies

(If a firm has branch offices, complete for each specific branch office seeking work.)

1. ***Annual Request for Qualifications***

a. FIRM (OR BRANCH OFFICE) NAME:	**Natural Channel Design, Inc.**
b. FIRM (OR BRANCH OFFICE) STREET:	**206 South Elden Street**
c. FIRM (OR BRANCH OFFICE) CITY:	**Flagstaff**
d. FIRM (OR BRANCH OFFICE) STATE:	**AZ**
e. FIRM (OR BRANCH OFFICE) ZIP CODE:	**86001**

f. YEAR ESTABLISHED:	**2000**

(g1). OWNERSHIP - TYPE:	**S-Corp**
(g2) OWNERSHIP - SMALL BUSINESS STATUS:	**Small Business**

h. POINT OF CONTACT NAME AND TITLE:	**Allen Haden, Vice-President**
i. POINT OF CONTACT TELEPHONE NUMBER:	**928-774-2336**
j. POINT OF CONTACT E-MAIL ADDRESS:	Allen@naturalchanneldesign.com

k. NAME OF FIRM *(If block 1a is a branch office)*:	

2. EMPLOYEES BY DISCIPLINE

a. Discipline Title	b. Function: Primary (P) or Secondary (S)	c. No. of Employees - Firm	d. No. of Employees - Branch
Agricultural Engineer	S		
Biologist	P	1	
CADD Technician	S		
Civil Engineer	P	2	
Ecologist	P	1	
Environmental Engineer	P	1	
Environmental Scientist	S		
Geographic Information System	S		
Hydrologist	P	1	
Project Manager	S		
Water Resource Engineer	S		
Total	5 primary, 6 secondary	6	

3. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST YEAR

a. Approximate No. of Projects	b. Experience	c. Revenue Index Number *(see below)*
1	Conservation and Resource Management	1
2	Construction Management	1
1	Construction Surveying	1
1	Dams (Concrete; Arch)	1
1	Digital Elevation and Terrain Model Development	1
1	Ecological and Environmental Investigations	1
1	Fisheries; Fish Ladders	1
1	Irrigation; Drainage	1
1	Pipelines (Cross-Country – Liquid and Gas)	1
1	Structural Design; Special Structures	1
1	Sustainable Design	1
1	Storm Water Handling and facilities	1
1	Specifications Writing	1
1	Topographic Surveying and mapping	1
1	Water Resources; Hydrology; Ground Water	1

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*)

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Stephanie Yard	**Principal/Project Manager/Senior Design Engineer**	1. TOTAL **27**	2. WITH CURRENT FIRM **14**

d. LOCATION *(City and State)*
Natural Channel Design, Inc. Flagstaff, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
BS Civil Engineering, Northern Arizona University	**Licensed Civil Engineer in the following states: Arizona (#26889), Alaska (#11189), New Mexico (#19006), Nevada (#20690), Utah (#26889)**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

ACOE Wetlands Delineation Certificate
Levels I-IV Applied Stream Morphology and Natural Channel Design courses from Wildland Hydrology
Extensive practical experience with conservation engineering in the Southwest.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
Laguna Conservation Area Environmental Restoration Yuma, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2015	**2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

1250 acre managed wetland creation for BOR LCRMSCP. 2010 through 2015, development of conceptual plans, permitting, development of final plans for grading, water control, water delivery and planting. Role was senior design engineer and design oversight.

2.

(1) TITLE AND LOCATION *(City and State)*
Restoration of the Gila River at Apache Grove, Greenlee County, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2015	**2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Development of restoration plan to address riparian habitat quality and floodplain connectivity/function on 30 ac. private lands along the Gila River. Funding through Arizona Water Protection Fund via Gila Watershed Partnership. Senior design engineer, geomorphology and hydraulics.

3.

(1) TITLE AND LOCATION *(City and State)*
Schultz Fire and Flooding

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Development, design and implementation of novel, geomorphically based watershed restoration practices following post wildfire flooding. Responsible for development and implementation of sediment source study, development and modeling of sediment reduction practices based on natural channel design principles.Senior Design Engineer, Grantwriter

4.

(1) TITLE AND LOCATION *(City and State)*
Picture Canyon Meander Restoration
Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2010	**2011**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Channel and wetland habitat creation on public lands along the Rio de Flag in Flagstaff. Develop concept, funding source, assessment and design documents for grading, structures and planting. Senior Design engineer and oversight.

5.

(1) TITLE AND LOCATION *(City and State)*
Rim Streams Aquatic Enhancement

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**2012**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X	Check if project performed with current firm

Geomorphic and biologic assessment of fish habitat on five Central Arizona Streams. Identify habitat deficiencies related to fish population constraints. Develop conceptual and final designs for enhancement utilizing natural channel design methodology. Senior Design Engineer.

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*)

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Allen Haden	**Ecologist/Project Manger**	**20**	**8**

d. LOCATION *(City and State)*
Natural Channel Design, Inc. (Flagstaff, AZ)

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Forestry and Wildlife, Virginia Tech. M. Sc. Aquatic Ecology, Northern Arizona University, Flagstaff	**NA**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

Applied Stream Morphology & Design Courses I-IV, Wildland Hydrology

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
Laguna Conservation Area Environmental Restoration Yuma, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2009 - 2015	**2012 - 2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

1250 acre managed wetland creation for BOR LCRMSCP. 2010 through 2015, development of conceptual plans, permitting, development of final plans for grading, water control, water delivery and planting. Role was ecologist, restoration planner, permit development, public outreach and project management.

2.

(1) TITLE AND LOCATION *(City and State)*
Restoration of the Gila River at Apache Grove, Greenlee County, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2010 - 2015	**2012**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Development of restoration plan to address riparian habitat quality and floodplain connectivity/function on 30 ac. private lands along the Gila River. Funding through Arizona Water Protection Fund via Gila Watershed Partnership. Provide assessment, concept plan, permitting and design for non native removal, dike removal, floodplain grading, native plant planting design, fencing and monitoring. Role was project management, vegetation mapping, permitting and planting.

3.

(1) TITLE AND LOCATION *(City and State)*
Schultz Fire and Flooding, Coconino County, AZ.

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2010 - 2015	**2013 - 2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Development, design and implementation of novel, geomorphically based watershed restoration practices following post wildfire flooding. Responsible for development and implementation of sediment source study, development and modeling of sediment reduction practices based on natural channel design principles. Measurement and identification of geomorphic reference sites, natural channel design analysis, public outreach for NEPA with USFS and construction obs.

4.

(1) TITLE AND LOCATION *(City and State)*
Virgin River Restoration Concept Plan, Lincoln County NV

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**NA**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Subcontract to Fred Phillips Consulting. Provided field assessment of geomorphology and hydraulics for multiple sites along Virgin River. Develop dimensions and conceptual planting designs based on natural channel design principles for conceptual restoration strategies. Provided field survey, geomorphic and hydraulic analysis as well as conceptual designs.

5.

(1) TITLE AND LOCATION *(City and State)*
Rim Streams Aquatic Habitat Enhancement, Gila County, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2006 - 2012	**2011**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X	Check if project performed with current firm

Geomorphic and biologic assessment of fish habitat on five Central Arizona Streams. Identify habitat deficiencies related to fish population constraints. Develop conceptual and final designs for enhancement utilizing natural channel design methodology. Provide information as needed for NEPA process. Provide pre-construction planning and construction observation. Responsible for project management, assessment, design development and construction observation.

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*)

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Michael Kearly	**Project Engineer**	1. TOTAL **19**	2. WITH CURRENT FIRM **1**

d. LOCATION *(City and State)*
Natural Channel Design, Inc., Flagstaff, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
BSc. Civil Engineering, Northern Arizona University	**AZ-Civil Engineer: 34587** **NV-Civil Engineer: 22774**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
Completed Levels I and II (Applied Fluvial Geomorphology and River Morphology & Applications) short courses as presented by Wildland Hydrolgy, David Rosgen.
Certified Floodplain Manager (CFM# US-11-05834) by the Association of State Flood Plain Managers.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
MSCP - Laguna Division Conservation Area
Yuma, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

1250 acre managed wetland/riparian habitat restoration/creation on the lower Colorado River below the Imperial Dam. Provided engineering support services during construction, responding to RFI's, preparing progress maps of grading for vegetation layout support and preparing record drawings for the project.

2.

(1) TITLE AND LOCATION *(City and State)*
Picture Canyon Meander Restoration - Phase II
Flagstaff, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Lead Designer for a steam channel restoration project within northeast Flagstaff. Project included field data collection, grading design and plan development, and preparation of Preliminary Jurisdictional Determination report for ACOE submittal and approval. Anticipated construction in late 2014. Total project costs, including design and construction approximately $250,000. Client - City of Flagstaff.

3.

(1) TITLE AND LOCATION *(City and State)*
Kerley Valley Irrigation Bridge Repair
Tuba City , AZ.

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Lead Designer/Project Manager.
Replacement of a failing bridge with box culvert at a perennial wash crossing of local road. Included hydrologic and hydraulic analysis as well as designing permanent scour protection to an impaired reach of the wash below the bridge. Client was the Bureau of Indian Affairs. Professional Service Fees - $19.5K. Anticipated construction in 2014.

4.

(1) TITLE AND LOCATION *(City and State)*
Mountain Meadow Farm Drainage Design
Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Lead Designer. Analysis of hydrology and hydraulics of the project site and upstream watersheds to determine best ways to increase stormwater runoff through the site and minimize the effects of off-site sediment transport and on-site erosion. This was followed by development of an engineered grading plan set and construction support services. Professional Service Fees - $10K

5.

(1) TITLE AND LOCATION *(City and State)*
East Industrial Drive Improvements,
Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2009	**2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☐ Check if project performed with current firm

Lead Designer for a half mile of improvements to convert an unpaved local road to a fully developed, paved corridor. Professional services included all hydrologic and hydraulic calculations, modeling and design of storm drain systems, stormwater detention basins, Low Impact Development (LID) measures and utility relocations. Professional Services Fees - $70K. Client - City of Flagstaff. Scheduled construction in 2014.

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*)

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Christopher Tressler	**P.E./GIS Specialist**	1. TOTAL **3.5**	2. WITH CURRENT FIRM **3.5**

d. LOCATION *(City and State)*
Natural Channel Design, Inc. Flagstaff, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
BS Civil Engineering, Utah State University, 2008 **MS Geology, Utah State University, 2011**	**Civil Engineer AZ #58521**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
Completed levels I-IV river short courses in natural channel inventory, classification, assessment, and design from David Rosgen at Wildland Hydrology. Completed Levels I – II river short courses from the Intermountain Center for River Rehabilitation and Restoration.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
Meadow Valley Wash Geomorphic Assessment, Caliente NV

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**NA**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager of a geomorphic assessment of 25 miles of Meadow Valley Wash. Work included field surveys, analysis of hydraulics, hydrology, geomorphic characterization and the development of treatment recommendations. Project budget ~$100,000

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*
Virgin River Restoration Plan and Environmental Assessment, near Mesquite, NV

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**NA**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Associate project manage for field work, development of geomorphic characterization and conceptual designs of potential restoration sites along the Virgin River, aimed at the improvement of stream function and increase in habitat for targeted species. NCD portion of project budget ~$40,000

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*
Post Schultz Fire - Watershed Restoration and Sediment Reduction EWP Project near Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2015	**2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Associate designer and field survey project manager for the development of sediment reduction strategies and channel restoration measures. Project wide budget > $11.5 million, NCD budget for assessment, design, and construction observation ~ $540,000

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☐ Check if project performed with current firm

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*)

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Mark Wirtanen	**Wildlife Biologist / Engineering Assistant**	1. TOTAL **23**	2. WITH CURRENT FIRM **14**

d. LOCATION *(City and State)*
Natural Channel Design, Inc., Flagstaff, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
BS Wildlife Biology, Northern Arizona University, 1990	***NA***

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
Levels 1- 3, Applied Fluvial Geomorphology, River Morph, Assessment & Monitoring. Wildland Hydrology,1998
Level 3, River Assessment and Monitoring. Wildland Hydrology 2011. Proficient in CAD (Terramodel and Civil 3D) as well as GIS (ArcView). Proficient in site survey with RTK GPS, total station and other technologies.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
Picture Canyon Rio de Flag Meander Restoration, Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**2011**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Restoration of stream and floodplain function on approximately 30 acre site along the Rio de Flag within the City of Flagstaff. Reconnect floodplain, enhance native riparian vegetation and habitat, remove noxious weeds. Provide survey data, develop design sheets and details under supervision of licensed engineer, provide GIS and CAD based exhibits for planning and design. Oversight of construction, revegetation and weed management crews.

2.

(1) TITLE AND LOCATION *(City and State)*
Restoration of the Gila River at Apache Grove, Greenlee County AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2012	**2012**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Restoration of floodplain function and native riparian habitat on approximately 30 acres of private lands along the Gila River. Removal of non functioning flood control berm, removal of nonnative tamarisk, revegetation with native riparian plants. Site survey. Provided biological and physical monitoring survey, identification weed species, GIS and CAD exhibits for monitoring and maintenance. Oversite of construction, revegetation and weed management crews.

3.

(1) TITLE AND LOCATION *(City and State)*
Post Schultz Fire - Watershed Restoration and Sediment Reduction EWP Project near Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2015	**2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Associate designer and assessor for the development of sediment reduction strategies and channel restoration measures. Project wide budget > $11.5 million, NCD budget for assessment, design, and construction observation ~ $540,000. Provided field assessment of geomorphology, survey as needed and construction observation.

4.

(1) TITLE AND LOCATION *(City and State)*
Arizona Department of Environmental Quality Relative Bed Stability Study

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Multi site study of geomorphic and biotic indices of stream stability to determine accurate rapid assessment tool for water quality and channel stability monitoring. Geomorphic survey of approximately 28 stream sites across the state. Provided field survey of geomorphology and biotic measurements, data base development, data analysis, CAD and GIS exhibits for reporting. Lead field survey crew.

5.

(1) TITLE AND LOCATION *(City and State)*
Lee Valley Fish Barrier Removal and stream stabilization, Apache County, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**NA**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X	Check if project performed with current firm

Provide geomorphically sound enhancements to stream and wetland following removal of non native fish barrier in the stream. Provided design of enhancements, development of construction sheets, specifications, quantities and construction sequence for Arizona Game and Fish Department under supervision of licensed engineer.

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*)

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Catherine Scudieri	**Environmental Engineer**	1. TOTAL **15**	2. WITH CURRENT FIRM **2**

d. LOCATION *(City and State)*
Natural Channel Design, Inc., Flagstaff, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
BSc. Civil Engineering Virginia Tech, 1991 **MSc. Environmental Engineering University of Illinois U-C, 1992** **MSc. Forestry Northern Arizona University, 2009**	**Engineer in Training (EIT), Illinois 1992**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
10 years environmental engineering experience with the EPA and 3 years biological technician (plants) with the Forest Service (Rocky Mountain Research Station). Published papers on ecological restoration research. Proficient in CAD (Terramodel and Civil 3D) and ArcGIS. Proficient in site survey with RTK GIS and other technologies.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
Picture Canyon Rio de Flag Meander Restoration, Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2015	

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Restoration of stream and floodplain function on approximately 30 acre site along the Rio de Flag within the City of Flagstaff. Reconnect floodplain, enhance native riparian vegetation and habitat, remove noxious weeds. Provide weed management mapping with GIS, weed management plan, develop design sheets and details under supervision of licensed engineer, provide GIS and CAD based exhibits for planning and design.

2.

(1) TITLE AND LOCATION *(City and State)*
Restoration of the Gila River at Apache Grove, Greenlee County AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Restoration of floodplain function and native riparian habitat on approximately 30 acres of private lands along the Gila River. Removal of non functioning flood control berm, removal of nonnative tamarisk, revegetation with native riparian plants. Provided biological and physical monitoring survey, identification weed species, GIS and CAD exhibits for monitoring and maintenance.

3.

(1) TITLE AND LOCATION *(City and State)*
Post Schultz Fire - Watershed Restoration and Sediment Reduction EWP Project near Flagstaff, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2015	

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Associate designer and field survey project manager for the development of sediment reduction strategies and channel restoration measures. Project wide budget > $11.5 million, NCD budget for assessment, design, and construction observation ~ $540,000

4.

(1) TITLE AND LOCATION *(City and State)*
Arizona Department of Environmental Quality Relative Bed Stability Study

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X Check if project performed with current firm

Multi site study of geomorphic and biotic indices of stream stability to determine accurate rapid assessment tool for water quality and channel stability monitoring. Geomorphic survey of approximately stream sites across the state. Provided field survey of geomorphology and biotic measurements, data base development, data analysis, CAD and GIS exhibits for reporting.

5.

(1) TITLE AND LOCATION *(City and State)*
South Fork Little Colorado River Fish Barrier Enhancements, Eager, AZ

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

X	Check if project performed with current firm

Provide geomorphically sound enhancements to existing non native fish barrier in the stream. Protect the stream from reinvasion after the increased runoff resulting from the Wallow Fire. Provided design of enhancements, development of construction sheets, specifications, quantities and construction sequence for Arizona Game and Fish Department under supervision of licensed engineer.

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Laguna Division Conservation Area Restoration Project ,Yuma County, Arizona	**2009-2015**	**2012-2015**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	**e. TOTAL COST OF PROJECT**
Bureau of Reclamation LCRMSCP	**$800,000**	**$25,000,000**

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

The Bureau of Reclamation is undertaking a large-scale restoration project within the Laguna Reach of the Colorado River near Yuma, Arizona, as part of the Lower Colorado River Multi-Species Conservation Program (LCR-MSCP). The project will restore water flows to the area and replace large stands of salt cedar with a mosaic of marsh, riparian and upland habitats, restoring as much as 1,200 acres of native vegetation along 3-miles of historic Colorado River meanders. The resulting wetland complex is expected to attract many migratory birds and increase acreage for several native birds and mammals on the Endangered Species list.

Project Objectives:

• Construct a water delivery system to convey 100 cfs of water to the wetland. This work includes the construction of a headworks tie-in to the Gila Gravity Main Diversion Structure, installation of 2,800 feet of 48-inch diameter HDPE pipe, and the construction of an outlet works structure.

• Remove invasive vegetation on the 1,200 acre site. This work includes clearing, grubbing, and burying salt cedar and other invasive species and associated long-term weed treatment thereafter.

• Re-contour site to optimize habitat. This work includes moving nearly 1.4 million cubic yards of soil in and around historic floodplain channels of the Colorado River. Spoils from excavation will be utilized to create maintenance roads and an associated trail system.

• Install multiple, large water control structures to allow seasonal water management and site maintenance.

• Revegetate the 1,200 acre site with a mosaic of native wetland, riparian, and upland plants.

Services Provided: Natural Channel Design, Inc. (NCD) is the lead design consultant for the project with revegetation and permitting assistance provided by Fred Phillips Consulting, LLC (FPC).

• Development of a Conceptual Restoration Plan – NCD provided conceptual design, quantities, and costs for a restoration and revegetation plan that maximized high-quality native riparian plant communities and associated wildlife habitats, minimized maintenance, protected existing infrastructure, and protected and/or enhanced existing riparian habitat.

• Development of a Detailed Feasibility Study – NCD provided a detailed alternative analysis that built upon the previous conceptual plan. Feasibility-level costs for infrastructure, revegetation, and long-term maintenance were provided as a basis for comparison. Based on the analysis, a preferred alternative was chosen by the MSCP steering committee.

• Permitting Assistance – NCD coordinated with the USBR on the Army Corps of Engineers (ACE) Jurisdictional delineation and NEPA compliance, and provided all documents for the ACE 404 permit and Stormwater Pollution Prevention Plan.

• Design for the Water Delivery System Plan – NCD provided analysis for the water delivery system, including hydraulic design, air/vacuum release valve design, pressure manhole design and associated fabrication details, throttling valve design, ring compression, deflection, and buckling analysis for typical pipe sections, buoyancy and thrust block analysis, and structural concrete design.

• Design for the Earthwork and Water Control Plan - NCD provided analysis for the grading and water control plan including hydraulic design and typical channel cross-section development for the wetland channels, earth balance calculations, structural

concrete calculations, overshot gate hydraulic design and the development of seasonal water maintenance hydrographs.

• Development of the Water Delivery System Plan & Earthwork and Water Control Plan – NCD created bid-ready construction drawings, technical specifications, and engineer's estimates for the project.

• Development of the Revegetation Plan – NCD worked with FPC, as needed, to develop the revegetation plan including plant types and zones and soil and water analysis.

• Project Coordination – Worked with MSCP to coordinate work and provide progress reports/presentations to the Yuma Area Office of USBR, project partners, local water users and irrigation districts, and local residents. All areas of the design were closely coordinated with the general contractor chosen for the project, and recommendations for constructability were incorporated in the final plans.

• Construction Observation – NCD observed construction as needed., provided RFI and redesign as required by site conditions

Project costs ~$25,000,000 NCD fees ~$800,000

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
Restoration of the Gila River at Apache Grove, near Duncan, AZ	PROFESSIONAL SERVICES **2010-2015**	CONSTRUCTION *(If applicable)* **2011**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Mr. Larry Barney	**$188,200**	**$744,000**

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Project was developed in response to a previously funded Arizona Water Protection Fund project, the Upper Gila River Fluvial Geomorphology Study (# 98-054WPF), and its recommendations. The study's recommendations for this property included the removal of the dike, which parallels the river and surrounds his center pivot field, to allow natural flooding to occur during high flow events and reduce the risk of erosion and land loss. The study also recommends the management of the invasive salt cedar community along the Gila to improve the riparian habitat and stream function and the stabilization of eroded banks in the area with native plants. With this project, we intend to implement study recommendations and demonstrate how they can benefit the river, the adjacent land, the project landowner, and ultimately, the community and the state of Arizona. It is hoped that the success of this project will encourage other landowners to make a similar investment in improving the health and function of the Gila River.

The purpose of this project is to restore natural floodplain function and riparian habitats along 1.6-miles of the Gila River on 200-acres in the Apache Grove area near Duncan. The objectives of the project are to:

• To restore natural stream function by the removal of dikes in the project area allowing natural flooding to occur during high flow events. Land within the Pima alluvium would be inundated but would remain relatively intact rather than lost to extensive erosion.

• To reduce the risk of lateral erosion and land loss to the adjacent private property by removal of the dikes and stabilization of at-risk banks within the project area using bioengineering practices with native plants and low-impact structural measures.

• To manage the invasive salt cedar community and revegetate with native species to improve the riparian habitats and stream function.

• To provide a successful example for other landowners along the upper Gila River demonstrating how to accommodate production agriculture along with proper stream function.

Services Provided:

• Permitting – NCD developed and submitted the Army Corps of Engineers (ACE) Jurisdictional Delineation and 404 permit, Arizona Department of Water Quality 401 certification, Endangered Species Act Section 7 Consultation with U.S. Fish and Wildlife Service, and Stormwater Pollution Prevention Plan.

• Site Assessment Plan Development and Implementation – NCD developed and implemented a site assessment plan which formed the basis of the overall design. The plan included an evaluation of the hydrology, hydraulics, and geomorphology of the channel/floodplain, an evaluation of the existing riparian vegetation, an evaluation of riparian corridor habitats, and the establishment of local reference conditions for the aforementioned resources.

• Hydraulic Modeling – NCD developed a hydraulic model of the river study reach using HEC-RAS and RiverCAD. The model was used to compare and evaluate hydraulics for the pre- and post-development conditions, including dike removal, floodplain re-contouring, and cutbank repair, for varying flow conditions (Q10, Q25, Q50, and Q100).

• Grading Design & Earth Balance – NCD developed a grading plan for the dike removal, floodplain re-contouring, and cutbank repair based on the results of the Geomorphic and Hydraulic Modeling study. NCD worked closely with the landowner to locate spoil areas in fields that would benefit from the addition of granular soils and/or re-leveling.

• Bioengineering & Revegetation Design – NCD designed multiple bioengineering works, including vegetative spurs and brush

revetment, to stabilize banks within the study reach. NCD also designed and oversaw the implementation of a revegetation plan that restores the native riparian community to the floodplain.

• Comprehensive Design Plan- NCD developed a comprehensive design plan for the project which included an overall design report and bid-ready construction drawings, technical specifications, and engineer's estimate. NCD coordinated a pre-bid and a pre-construction site showing, procured contractor bids, staked out the site for construction, and oversaw the work.

• Invasive Species Management Plan Development and Implementation – NCD developed and oversaw the implementation of the invasive species management plan, which outlined areas of removal, recommended methods, and estimated costs. NCD coordinated a pre-bid and a pre-construction site showing, procured contractor bids, staked out the site for construction, and oversaw the work.

• Fencing Plan – NCD developed a fencing plan for the landowner describing equipment, supplies, and activities necessary for removal of existing fencing and construction and maintenance of a four-strand barbed wire fence necessary to protect the native vegetation buffer. The plan also described livestock management procedures necessary to protect those areas undergoing construction, revegetation, and fence construction activities and associated costs.

• Public Outreach Plan – NCD will aid the Gila Watershed Partnership in implementing the Public Outreach Plan by providing a workshop for the Arizona Riparian council in March of 2012.

• Monitoring Plan and Implementation – NCD developed a plan to monitor stream channel stability, bank stability, bioengineering, and photo-point activities of the project. The Monitoring Plan included provisions for baseline monitoring and annual monitoring throughout the contract period.

Project costs ~$740,000 NCD fees ~$188,200

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Schultz Emergency Watershed Protection Project, Coconino County, AZ	**2010 - 2015**	**2013 - 2015**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Coconino County	**$1,500,000**	**$10,000,000**

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

The June 2010 Schultz fire on the Coconino National Forest burned approximately 15,000 acres of ponderosa pine forest on the eastern flanks of the San Francisco Peaks approximately four miles northeast of Flagstaff, Arizona. Increased runoff from the burned area has caused extreme flooding in the neighborhoods located downstream. Post fire flooding has damaged stream channels and caused increased erosion and sediment supply to the lower reaches of seven affected watersheds. Natural Channel Design (NCD) worked with Coconino County and other engineering firms to provide management and liaison services as well as comprehensive planning towards the greater Schultz watershed drainage master plan under the USDA NRCS Emergency Watershed Protection Program (EWP). This program provides financial and technical assistance for projects relating to flooding and erosion.

The project included quantification of sediment sources and transport for multiple watersheds. Sediment source studies were utilized to prioritized restoration treatment areas. Natural Channel Design, Inc. was responsible for restoration of eroded stream channels and innovative design and implementation of alluvial fan restoration on multiple watersheds.

Project Status: Project was funded by NRCS in 2012. Four large scale watershed designs are complete, both on-forest and through the neighborhood; with construction complete on those designs. As of summer 2014. Summer 2013 monsoon rain events were significant, but runoff never entered into the neighborhood from restored watersheds; flows spread across rehabilitated fans on-forest as intended. Continued comprehensive planning efforts are ongoing; with another major design scheduled for implementation in late 2014. This complex project required coordination with USFS, Coconino County, local residents and many design consultants and contractors. The Schultz EWP projects have provided a model for cooperation between local governments and federal agencies focused on a comprehensive approach to watershed restoration and property protection in the aftermath of wildfire.

Services Provided:

- Public Outreach
- Preparation of EWP funding requests
- USACE 404 jurisdictional determination
- Sediment reduction analysis
- Property damage assessment and data gathering
- Prepared NEPA documents for USFS Environmental Assessment (NCD, 2012)
- Design of flood mitigation on private properties
- Development of geomorphically based restoration concepts for national forest lands
- Development of construction sheets, specifications and cost estimates for watershed protection measures
- Construction observation services
- ~$10 million Construction, ~1.5 million Design Services

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Rim Streams Aquatic Habitat Enhancement, AZ	**2006 ongoing**	**2012**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Arizona Game and Fish Department	**$190,000**	**Construction is ongoing. Project is on budget.**

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Through separate projects ranging over several years Arizona Game and Fish Department contracted with NCD to provide aquatic habitat assessments, conceptual design, final design, assistance with permitting and outreach as well as construction observation and oversight for five different trout stream along the Mogollon Rim in Arizona. All streams were important fisheries that had been impacted by flooding, fire, changes in land use as well as water diversion and importation. NCD provided on the ground assessment of stream stability and habitat quality, research of existing water quality and fisheries reports on each stream to assess biological limitations then developed conceptual plans and costs for each stream. Once conceptual plans had been fully vetted by the department, construction documents were developed for each stream. Plans had to conform to USFS requirements and be implementable with hand and machinery crews. To date, one stream has been constructed and monitored with good results indicating that the designs were meeting both the departments and fishing publics goals. Four remaining streams are in the permitting process. Streams include: Tonto Creek, Canyon Creek, Haigler Creek, Christopher Creek and the East Verde River.

NCD fees: ~$190,000

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
Picture Canyon : Rio de Flag Meander Restoration Project, Flagstaff, AZ	PROFESSIONAL SERVICES **2006-2015**	CONSTRUCTION *(If applicable)* **2010 and 2014**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Flagstaff	**$280,000**	**$580,000**

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

The Rio de Flag is the primary watercourse winding through Flagstaff, Arizona. The stream channel is ephemeral or intermittent depending on the season and local geology. Sometime in the past, the stream channel below the canyon was dredged and straightened, removing a number of natural meanders. The dredged and straightened section had no access to its floodplain and supported a very limited riparian plant community. Noxious weeds invaded the site due to the soil disturbance from the trenching activities. The result was a significant narrowing of the riparian area and a rapid transit of the perennial stream flow, effectively reducing riparian and wetland habitat.

Project Objectives:

The goal of the project is to restore the fluvial processes of the stream and enhance the riparian corridor for habitat, recreation, and aesthetics. Specific objectives included: eliminate noxious weeds, restore channel meander and floodplain function, restore native riparian and wetland plant communities, increase plant species diversity, create additional wetland habitats, improve water quality, increase wildlife habitat, provide recreation and aesthetic benefits, and demonstrate and educate the general public of the restoration methods. The riparian and wetland area have roughly doubled in size from 2 to 5 acres.

Services Provided:

Natural Channel Design, Inc. (NCD) is the lead design consultant for the project.

• NCD prepared complete engineering drawings and construction specifications along with detailed design reports.

• Design analysis including: hydrologic, hydraulic, geomorphic, and biological studies; riparian surveys and biological evaluations.

• Engineering design of conservation practices: deepwater wetland and riparian habitat, water control structures, temporary irrigation system, revegetation, stream meander restitution, erosion control, temporary exclosure fencing, and integration of the area into the master plan for the Flagstaff Urban Trail System.

• Permitting under sections 404 and 401 of the Clean Water Act, State Historic Preservation Office clearance, Section 7 consultation with US Fish and Wildlife Service, water rights clearances, Arizona State Lands Right of Way, Northern Arizona University Centennial Forest use permit, City of Flagstaff and Coconino County Grading permits, and Arizona Pollutant Discharge Elimination System permits for discharge of reclaimed wastewater.

• Construction oversight during earthwork and temporary fencing installation.

• Labor, oversight, and management of irrigation system installation, revegetation, invasive species removal, annual monitoring, and public workshop activities.

- Weed management design and implementation of integrated weed management program
- Project Monitoring of gemomorphic stability, vegetation restoration and weed management success.

Public outreach was also a very important part of this project. Natural Channel Design partnered with many public, private, and governmental entities, including: City of Flagstaff, Coconino County Board of Supervisors, US Fish and Wildlife Service, Coconino Natural Resource Conservation District, City of Flagstaff Wildcat Hill Wastewater Treatment Plant, Arizona State Land Department, Manterola Sheep Company, Arizona Game and Fish, Northern Arizona University – Centennial Forest, Northern Arizona University – Anthropology, City of Flagstaff – Open Space Commission, University of Arizona Cooperative Extension, Coconino National Forest, Flagstaff Biking Organization, Northern Arizona Trail Runners Association, Museum of Northern Arizona, Audubon Society, Picture Canyon Core Working Group, Friends of Rio de Flag, Rupestrian Cyberservices, and Natural Resources Conservation Service.

Project costs ~$580,000 NCD fees ~$280,000

6. ADDITIONAL INFORMATION

a. PROVIDE ANY ADDITIONAL INFORMATION YOU FEEL MAY BE NECESSARY TO DESCRIBE YOUR FIRMS QUALIFICATIONS. *(ATTACH ADDITIONAL SHEETS AS NEEDED.)*

Natural Channel Design, Inc. (NCD) is an engineering consulting firm with an interdisciplinary team of natural resource specialists providing services in conservation engineering, restoration ecology, natural resource planning and river engineering. NCD specializes in research, assessment, and design of natural resource planning efforts. NCD has been operating for over 15 years and has designed, managed, helped permit, and supervised construction of numerous riparian and aquatic restoration projects throughout the southwest. NCD has extensive experience in watershed assessment, stream geomorphology, hydrology, hydraulics, wetland and riparian ecology, wildlife biology, vegetation, bioengineering, drainage, erosion control, irrigation, wetland delineation, stream bank stabilization, GIS and spatial modeling, and has applied that expertise to community planning, design and permitting of projects for federal and state agencies, tribal entities, municipalities, and private owners. The focus of these projects has ranged from stream stabilization and reduction of flood and erosion damage to aquatic and riparian habitat enhancements to benefit specific target T&E species. Our team is experienced in working with multiple partners with varied objectives to design and implement successful projects that benefit aquatic and riparian resources.

Our work utilizes a combination of stream assessments and geomorphic evaluations supplemented by analytic assessments. Stream channel assessment requires three distinct steps: characterization of existing conditions, identification of the potential, or reference condition, for the system, and finally comparing the existing condition against the potential of the system to identify stream needs and design criteria. The geomorphic approach utilizes the characterization of an appropriate, functioning "reference reach" to establish the basic geomorphic design parameters. Once these parameters are established an analytical assessment of critical velocities, shear stresses, and other physical processes are incorporated to complete the design to meet project objectives.

Stream channels are created and maintained by the processes of their watersheds. In simplistic terms, their primary functions are to convey flood flows, transport sediment, and dissipate energy. To perform these functions, the fluvial processes of the stream create specific forms. The inherent stability of any natural channel is dependent on an appropriate dimension, pattern, and profile of the bankfull channel and associated floodplain and terraces. Many times traditionally "designed" or engineered channels have resulted in altered natural stream forms reducing the stream's ability to perform its basic functions. Closely matching the central tendencies of the natural channel in both form and process results in a design that works with the existing stream processes rather than against it reducing instability and maintenance cost.

We also consider how society and the natural processes of rivers can coincide. We have pioneered ways to safely and effectively integrate river function with public safety and community needs. Instead of delineating a river with levees or rock walls, we design projects by considering riparian corridors segmented in three zones: where river function takes precedence, where society and the river can share land and moderate floods can occur without major damage, and where threats from the river to the riverside community are minimized.

The results are design components that lie within the natural variability of stream channel morphology, sediment transport, watershed hydrology, valley shape/slope, and alluvial substrate along with educational, aesthetic, recreational, and other social considerations that will best meet project objectives. We have successfully extended these principles to a range of projects including habitat enhancement, bank stabilization, transportation infrastructure, drainage design, cultural resource protection, fish passage, and watershed planning efforts in both urban and rural environments.

Our firm also provides construction planning, supervision and public outreach for our projects. A project's success is often dependent on stakeholder and general public understanding of objectives and goals as well as the techniques utilized. We try to include public outreach and education in as many of our projects as possible. Additionally, we have found that successful implementation requires close supervision of work crews, which may be unfamiliar with many of the practices. By providing construction planning and observation services we are able utilize local labor and construction services while insuring clients high quality implementation and reasonable cost.

Specific Expertise

- Engineering drawings and construction specifications along with detailed design reports.
- Hydrologic and hydraulic studies, geomorphology, riparian surveys and biological evaluations for design analysis, stream enhancement and/or restoration for riparian, aquatic, stability, and water quality objectives.
- Sediment transport and conveyance analysis
- Assessments of stream stability and productivity.
- NCD utilizes Arc-GIS, Civil 3-D, Terramodel, Rivermorph, Hec-Ras, various cross section and hydraulic analysis tools as well as custom excel spread sheets for analysis and data transfer among team members
- Design development for habitat and biological goals to aid recovery of T&E species including specific habitat features key to specific life stages and food supply of target species.
- Prepares permit documents for Army Corp 404 and 401 of the Clean Water Act or other necessary permits.
- Delineating wetlands and developing restoration plans.
- Stream bank protection and stabilization including bioengineering techniques
- Engineering design of water diversions, low water road crossings, and other transportation infrastructure relating to stream channels.
- Design services for conservation practices such as ponds, pipelines, water control structures, irrigation systems, waste systems, flood control and erosion control.
- Design of riparian and wetland revegetation and weed management projects
- Development of grant applications and grant management services to provide funding for restoration projects
- Professional Engineering licenses in Utah, Arizona, Nevada, New Mexico and Alaska.

NCD has a history of providing a complete line of services to help clients, assess, fund, permit, design, implement and monitor successful restoration and enhancement projects. We can provide complete services for these and similar projects or work in cooperation with other firms and agencies to plan and implement projects.

7. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

a.	Percentage of Total Work Attributable to State, Federal and Municipal Government Work:	97%
b.	Percentage of Total Work Attributable to Non-Government Work:	3%

8. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.

Signature: Allen Haden Digitally signed by Allen Haden DN: cn=Allen Haden, o=Mango Tree Enterprises, ou, email=ahaden@commspeed.net, c=US Date: 2014.12.18 16:33:19 -07'00' Date: December 18, 2014

Name: Allen Haden Title: Vice President NCD